PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

Pluckrose, Anthony W.
BOULT WADE TENNANT
Verulam Gardens
70 Gray's Inn Road
London WC1X 8BT
GRANDE BRETAGNE

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing *(day/month/year)*	13.05.2004
Applicant's or agent's file reference	**IMPORTANT NOTIFICATION**
AWP/P60449/001	

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/GB 03/03301	30.07.2003	30.07.2002

Applicant
LOTUS CARS LIMITED et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international preliminary examining authority:

European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized Officer
Lindquist, P
Tel. +49 89 2399-2324

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference AWP/P60449/001	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/GB 03/03301	International filing date *(day/month/year)* 30.07.2003	Priority date *(day/month/year)* 30.07.2002
International Patent Classification (IPC) or both national classification and IPC F01L9/02, F01L9/02		
Applicant LOTUS CARS LIMITED et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
13.01.2004	13.05.2004
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Clot, P Telephone No. +49 89 2399-2724

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB 03/03301

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-8 as originally filed

Claims, Numbers

1-8 as originally filed

Drawings, Sheets

1/2-2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-8
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-8
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-8
	No:	Claims	

2. Citations and explanations

   see separate sheet

Re Item V

D1: GB-A-1 324 456
D2: US-A-2 630 136 (not cited in search report)
D3: US-A-5 881 689

Novelty

D1 discloses an electrically operated valve for controlling flow of hydraulic fluid comprising
a valve housing 1
a spool 4 slidable in a spool chamber in the valve housing
a first (such as left side conduit 3 on fig.1), second (such as right conduit 3 on fig.1) conduits extending through the valve housing and suitable for connecting the spool chamber with any apparatus to which it might be connected,
a third conduit 2 in communication with the spool chamber and suitable for delivering to or receive fluid from any apparatus, provided it is connected thereto
the spool is biased to a rest position (Fig.1) by a pair of opposed springs 7
the spool in the rest position closes off the first and second fluid conduits 3,3 from the spool chamber and thereby prevent flow of fluid to or from the third fluid conduit 2
the valve has a first electric coil A associated with a first end of the spool and a second electric coil A associated with a second end of the spool
whereby the first electric coil can be activated to displace (towards left on fig.1) the spool from the rest position thereof to open the first fluid conduit to the spool chamber and thereby to allow fluid communication between first and third conduits through the spool chamber;
in this position however, the second fluid conduit is not kept closed, as required by present claim 1
and whereby the second electric coil can be activated to displace (towards right on fig.1) the spool from the rest position thereof to open the second fluid conduit to the spool chamber and thereby to allow fluid communication between third and second conduits through the spool chamber;
in this position however, the first fluid conduit is not kept closed, as required by present claim 1.

The same comments apply equally to document **D2**, not cited in the search report: this documents sets out the use of the valve for a double acting device (column 2, lines 38) and the fact that the spool is biased in a centered position (shown on figure 1) by opposed springs 48, and when it leaves this rest position under the actuating

electromagnetic force of a coil 70, it provides communication of either first conduit 13 or second conduit 15 with the central -third- conduit 16, whereby however the other of the first and second conduit is then not kept closed (column 6, lines 24-36).

The subject-matter of claim 1 thus differs from this prior art in that when the first conduit is opened and communicates with the third conduit, the second conduit remains closed and in that when the second conduit is opened and communicates with the third conduit, the first conduit remains closed.

D3 discloses an engine valve operated by a pressurized fluid through an electrically operated valve 6; this valve 6 has a spool slidable in a spool chamber and three conduits 7 ,16 and 10 in its housing, a first one 7 for connecting the spool valve chamber with a source of pressurised fluid, a second one 16 for connecting the spool chamber with a reservoir of fluid, a third one 10 in communication with the spool chamber an which delivers fluid to or receives fluid from the upper work space 3. This spool however is not biased to a rest position by a pair of opposed springs and it is not actuated by electric oils but rather through fluid pressure. There is also no rest position in which both conduits 7 and 16 would both be closed: the spool rather takes two different positions permitting communication of the working chamber 3 through port 10 either with the pressure line through port 7 or with the return line through port 16.

The object of claim 1 is thus novel over this prior art.
The independent method claim 6 being a method of operating the electrically operated valve of claim 1, it requires this valve as part of the method and is therefore also novel.
The independent claim 7 being a system including the valve of claim 1 is also novel.

The claims 1-8 fulfil the requirements of novelty in accordance with Art.33(2) PCT.

Inventive step

The valve of D1 appears to be rather designed, with its central inlet port 2 and on both sides of this inlet ports respective outlet ports 3, for use with a double acting cylinder. Should a skilled person wish to adapt the valve of D1 so that it is suitable for controlling in- and out-flow to and from a single working chamber, the teaching of D2 could be considered. In this case, the central port could be connected to the working chamber and the respective ports 3 could be connected to the inlet (such as port 7 o D2) and to the return line (such as port 16 of D2).
The spool however would then, along the teaching of D2, no longer be adapted for having a rest position in which both the first and the second conduits are both closed,

but rather would be adapted to take only two positions, these positions communicating the working chamber either to the pressure port or to the return line.

The features of claim 1 and thus also of the independent claims 6 and 7, cannot be derived without ex-post facto consideration from the available prior art.

The claims 1-8 fulfil the requirements of inventive step in accordance with Art.33(3) PCT.

Industrial application

A valve in accordance with claims 1-5, a method in accordance with claim 6 or a system in accordance with claims 7 and 8 are obviously industrially applicable.

INTERNATIONAL SEARCH REPORT

Internati pplication No
PCT/GB 03/03301

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 F01L9/02 F01L1/46

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 F01L F16K F15B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	GB 1 324 456 A (SUGIMURA N) 25 July 1973 (1973-07-25) the whole document	1,2,6,7
Y	US 5 881 689 A (HOCHHOLZER TIMO) 16 March 1999 (1999-03-16) the whole document	1,2,6,7
A	US 3 696 836 A (BAUER LEO) 10 October 1972 (1972-10-10) column 2, line 52-68; figure 1	3,4
A	US 6 170 524 B1 (GRAY JR CHARLES L) 9 January 2001 (2001-01-09) figures	5

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
3 November 2003	07/11/2003

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Klinger, T

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Internati Application No
PCT/GB 03/03301

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 1324456 A	25-07-1973	NONE	
US 5881689 A	16-03-1999	DE 19543080 A1	22-05-1997
		JP 9151715 A	10-06-1997
US 3696836 A	10-10-1972	CA 936068 A1	30-10-1973
		DE 2163153 A1	20-07-1972
		FR 2121591 A5	25-08-1972
		GB 1362664 A	07-08-1974
		IT 945239 B	10-05-1973
		JP 53038377 B	14-10-1978
		SE 371476 B	18-11-1974
US 6170524 B1	09-01-2001	NONE	